State of California The Resources Agency DEPARTMENT OF FISH AND GAME

Final Land Management Plan for the Mouth of Cottonwood Creek Wildlife Area Shasta County, California

June 2011

PREPARED FOR:

California Department of Fish and Game North Coast Region Headquarters 601 Locust Street Redding, CA 96001

PREPARED BY:

Sustain Environmental Inc. 3104 "O" Street #164 Sacramento, California 95816 916.457.1856

APPROVED BY:

Neil Manji – Regional Manager, Northern Region	Date
Sonke Mastrup - Deputy Director	—— —————— Date

TABLE OF CONTENTS

Mouth of Cottonwood Creek Wildlife Area Land Management Plan

	Table of Contents	i
	List of Figures	iii
	List of Tables	iv
	Acknowledgements	
	Acknowledgements	v
	INTRODUCTION	
Ι.	INTRODUCTION.	
	About the California Department of Fish and Game	
	About the Mouth of Cottonwood Creek Wildlife Area	1-2
11.	PROPERTY DESCRIPTION	II-1
	A. Geographical Setting	II-1
	B. Property Boundaries and Adjacent Land Use	
	1. Cottonwood Creek Unit	
	Balls Ferry Wetland Units 1 and 2	
	3. Easements and Rights-of-Way	
	C. Climate and Geology	II-11
	1. Climate	
	2. Soils	
	3. Hydrology	II-16
	D. Cultural History	II-21
	1. Pre-European History	II-21
	2. Pre-European Ethnography	II-22
	3. Post-European History	II-25
	4. Cultural Resource Sites	II-27
	5. Existing Structures	II-29
	HABITAT AND SPECIES DESCRIPTIONS	111 4
	HABITAT AND SPECIES DESCRIPTIONS	
	A. Flora	
	Plant Community Types, Cottonwood Creek Unit Plant Community Types, Balls Ferry Wetland Unit 1	
	Plant Community Types, Balls Ferry Wetland Unit 1 Plant Community Types, Balls Ferry Wetland Unit 2	
	B. Fauna	
	C. Endangered, Threatened and Rare Species	
	Special Status Plants	
	2. Special Status Wildlife	111-40
IV.	MANAGEMENT GOALS	IV-1
	A. Definitions of Terms Used in This Plan	IV-2
	1. Elements	
	Goals and Objectives	
	Tasks and Adaptive Management Strategies	

В.	Biological Elements	IV-4
	1. Riverine and Riparian Habitat Element	IV-6
	2. Freshwater Wetland Habitat Element	IV-11
	3. Vernal Pool and Seasonal Pond Habitat Element	IV-15
	4. Annual Grassland Habitat Element	IV-18
	5. Oak Woodland Habitat Element	IV-22
•	Biological Monitoring Elements	17. 27
C.		
	Riverine and Riparian Habitat Monitoring Element	
	2. Freshwater Wetland Habitat Monitoring Element	
	Vernal Pool and Seasonal Pond Habitat Monitoring Element	
	4. Annual Grassland Habitat Monitoring Element	
	Oak Woodland Habitat Monitoring Element	IV-43
D.	Public Use Elements	IV-50
	Public Access Information and Education Element	IV-52
	2. Hunting Element	IV-53
	3. Fishing Element	IV-54
	4. Day Hiking Element	IV-55
	5. Nature Observation Element	IV-56
_	Balls Ferry Research and Education Center Conceptual Plan Elements	IV EQ
	Sustainability and Strategic Planning Element	
	Research and Monitoring Coordination Element	
	Youth Educational Programs Development Element	
	Research and Education Facilities Use Element	
F.	Facility Maintenance Elements	
	Health and Safety Element	IV-67
	2. Fire Management	
	3. Vegetation Management and Grazing	IV-69
	4. Vector Control	IV-71
	5. Water and Flood Management	IV-72
	6. Access Roads, Parking and Trails	IV-73
	7. Signage, Fencing and Gates	IV-74
	8. Structures	IV-75
	9. Equipment	IV-76
G.	Cultural Resource Element	IV-78
Н.	Resource Coordination Element	IV-80
-		
OF	PERATIONS AND MAINTENANCE SUMMARY	V-1
A.	Staff and Equipment	
	1. Personnel Needs	
	2. Capital Equipment Needs	V-4
В.	"Step Down" Activities	V- 5
	1. Biological Resources	
	Cultural Resources	
_		
C.	Funding Sources	
	Operations and Maintenance	
	2. Capital Improvements / Restoration and Enhancement	V-6
D.	Operations and Maintenance Tasks	V-7
E.	Future Revisions to this Plan	V-8
		4-0

٧.

VI.	REFERENC	ES	VI -1
VII.	DOCUMEN	T PREPARATION	VII-1
APP	ENDICES		
	A: MCCWA F	Property Records	
	B: MCCWA F	Plant Species Inventory	
	C: MCCWA	Animal Species Inventory	
	D: MCCWA	Weed Management Plan	
	E: Grazing N	Management Tools	
	F: MCCWA I	LMP CEQA Checklist	
	G: Data and	Monitoring Resources for Adaptive Management of the MCCWA (hyperlinked)	
	H: Regional	Habitat Conservation Planning Documents Relevant to the MCCWA (hyperlinked)	
	I: Balls Feri	ry Research and Education Center (BFREC) Administrative Record (in chronological order)	
	J: Environm	nental Literacy Research Releveant to the Balls Ferry Research and Education Center (hyperli	nked)
	K: Acronym	s and Hyperlinks	
	L: Response	e to Public comments	
List	of Figures		
	Figure II a.	Regional Location, Mouth of Cottonwood Creek Wildlife Area	II-2
	Figure II b.	Boundary Map, Mouth of Cottonwood Creek Wildlife Area (Townships 29N and 30N, Range	
	Figure II c.	Parcel Boundaries, Cottonwood Creek Unit (topographic view)	11-6
	Figure II d.	Parcel Boundaries, Cottonwood Creek Unit (aerial view)	11-7
	Figure II e.	Parcel Boundaries, Balls Ferry Wetland Units 1 and 2 (topographic view)	
	Figure II f.	Parcel Boundaries, Balls Ferry Wetland Units 1 and 2 (aerial view)	
	Figure II g.	Soil Types, Cottonwood Creek Unit	II-14
	Figure II h.	Soil Types, Balls Ferry Wetland Units 1 and 2	II-15
	Figure II i.	Annual Maximum Peak Discharges of Cottonwood Creek near Cottonwood, California	
		(USGS Gage #11376000), 1941-2003	II-17
	Figure II j.	Major Channel Alignments, Lower Cottonwood Creek between Interstate 5 and the	11 10
	Eiguro II k	Sacramento River, 1855-1999 Aerial Photo Comparison of Lower Cottonwood Creek between Interstate 5 and the	11-18
	Figure II k.	Sacramento River, 1939–1999	II ₋ 19
	Figure II I.	Water Conveyance, Balls Ferry Wetlands Units 1 and 2	
	Figure II m.	Map of the Mexican Land Grant to P. B. Reading, Rancho Buena Ventura	
	Figure II n.	Existing Buildings and Fences, Balls Ferry Wetland Units 1 and 2	
	Figure III a.	Plant Community Types, Cottonwood Creek Unit, MCCWA (topographic view)	111-6
	Figure III b.		
	Figure III c.	Plant Community Types, Balls Ferry Wetland Units 1 and 2, MCCWA (topographic view)	
	Figure III d.	3 3.	
	Figure III e.		
	Figure III f.	Fox sedge (Carex vulpinoidea), Balls Ferry Wetland Unit 1, MCCWA	111-32
	Figure IV a.	Riverine and Riparian Focal Species	IV-33
	Figure IV b.	Freshwater Wetland Focal Species	IV-37
	Figure IV c.	Annual Grassland Focal Species	
	Figure IV d.	Oak Woodland Focal Species	IV-45

List of Tables

Table II a.	Acquisition History, Mouth of Cottonwood Creek Wildlife Area
Table II b.	Temperature and Precipitation Averages, Redding, California
Table II c.	Soil Types, Mouth of Cottonwood Creek Wildlife Area
Table III a.	Crosswalk of Plant Community Types at the MCCWA
Table III b.	Special Status Vascular Plant Species with Potential to Occur at the MCCWA
Table III c.	Special-Status Wildlife Known to Occur or With Potential to Occur at MCCWA
Table IV a.	Crosswalk of Biological Elements and Plant Communities at the MCCWA
Table IV b.	Potential Recreational Activities at the MCCWA and Criteria Used to Determine Compatible Uses IV-51
Table V a.	Estimated Annual Labor Cost of MCCWA LMPV-3
Table V b	Additional Equipment Needs for the MCCWA V-4

Acknowledgements

The California Department of Fish and Game (CDFG) prepared the Mouth of Cottonwood Creek Wildlife Area land management plan (MCCWA LMP) with assistance from Sustain Environmental Inc. (SEI) and its affiliates. CDFG provided overall guidance for the planning process and was responsible for all decisions about the content of the plan.

SEI, under contract to the CDFG, provided technical and scientific expertise and was responsible for most administrative aspects of the plan, including preparation and production of the draft LMP. The Geographical Information Center (GIC) at California State University, Chico, provided geographic information system support, compiled the spatial data and produced the aerial images and preliminary maps. Dr. Roy Buck of EcoSystems West Consulting conducted plant community mapping, compiled the species lists, and prepared the botanical resource report. Cultural resource specialist Scott Baxter of Past Forward Inc. conducted the literature and database review and field surveys to compile the cultural history of the Wildlife Area.

SEI is especially thankful for the assistance of Jim Chakarun, the current manager of the MCCWA, in providing access and critical information regarding management of the Wildlife Area; Karen Kovacs for her unwavering support of this project; and Steve Arrison (CDFG retired) for his visionary commitment towards making the Balls Ferry Wetland Unit a model for environmental education and outreach. We also wish to extend our deep appreciation to the teachers and administrators at the Anderson New Technology High School for their time and assistance in developing the environmental studies curriculum for the Balls Ferry Research and Education Center as well as their ongoing commitment to engaging young people in environmental education and research.

Ron Wolf granted us permission to use his exceptional photographs of many special status species, bringing to life the rich natural heritage of the region. We are also grateful to the many photographers and biologists who contribute their work to the science and creative commons to help expand human knowledge, understanding and appreciation of our world.

Finally, we are indebted to Kate Kane for embedding, reviewing, reactivating and resurrecting the numerous hyperlinks in this land management plan. Our goal was to provide a living document that would retain its usefulness over time for adaptive management purposes. While these hyperlinks were once all alive and well, the dynamic nature of the Web and the vagaries of software programs is likely to "endanger" at least a few. We have included a list of hyperlinks in Appendix K to help preserve as much of the active content as possible.